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To achieve its purpose, an initial teaching orthography (i.t.o.) should be as simple in form and substance as possible; it should be phonemic rather than phonetic. The 40 sounds distinguished by Pitmanic shorthand and some provision for schwa can serve as a basic code. The symbols can be derived from either of two major sources--standardizing the Roman alphabet by assigning each letter and digraph a single sound or supplementing the Roman alphabet by assigning a constant value to each of the 23 useful letters and by creating 17 or more new symbols. As far as possible, the i.t.o. should have only one symbol per sound and should regard the predominant spellings of traditional orthography (t.o.). The i.t.o. must have a similarity to t.o. that allows immediate readability for those familiar only with t.o. and permits easy transfer for i.t.o. students. An outstanding example of an i.t.o. which supplements the resources fo the Roman alphabet is the Initial Teaching Alphabet. An excellent example of a standardizing i.t.o. is World English Spelling. If it can be demonstrated that educational results from the standardizing i.t.o. are comparable with those of the supplementary type, the latter is preferable because of its similarity to t.o. References are listed. (BS)

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INITIAL TEACHING ORTHOGRAPHIES

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It is not without reason that this meeting is co-sponsored by I.R.A. and the Simpler Spelling Association. Logically, it is obvious that both reading and writing, and the teaching and learning of both, must be profoundly affected by the characteristics of our orthography, and historically this connection has been recognized for more than 4 centuries. John Hart, one of the earliest spelling reformers, writing in 1554 and again in 1570, entitled his publication 'A Method of Comfortable Beginning for all Unlearned Whereby They May Bee Taught to Read", and William Bullokar, who published about 1580 four books in his "Amended' spelling, made the point that for 'easy conference' the new orthography must not differ too much from the old. Translating those two statements into modern terminology of initial teaching media and compatibility, brings them right down to date.

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Ten years ago the title of my paper, if it was understood at all, would not have attracted a corporal's guard. Its timeliness is directly due to the conspicuous success of Sir James Pitman's Initial Teaching Alphabet, i.t.a. It is not my purpose here to discuss that success, either pro or con. At the 4th International i.t.a. Conference at Montreal last summer, I presented a paper "i.t.a.--Not spelling reform, but child and parent of spelling reform' (2),

which reviewed briefly the background of each and their interrelations, and I will not attempt to cover that ground again. What I shall try to do here is to examine the criteria for a phonemic notation for English for general use, and to point out the most significant differences involved in adapting such a notation to the particular purposes of an initial teaching orthography.

I take for granted, on the basis of a century and a quarter of experience, both in this country and Great Britain, that use of a phonemic notation as an initial teaching medium has, to say the least, an important contribution to make to education. My purpose here is to examine the resources available for creating such a notation, the qualities to be sought, the pitfalls to be avoided, and the principles which should guide the final synthesis and application of such a code. Where I may seem to speak with more assurance than the data I have time to present warrant, I can only plead that 70 years of writing English phonemically (in shorthand) and nearly 50 years of active concern with the problems of spelling reform, including various items of research, have given me a more than ordinary basis for judgment.

The problem may be broken down into an examination of sounds and symbols and the principles which should govern the assignment of symbols to sounds, including the influence of the particular purpose to be achieved.

Sounds

In the choice of sounds to be distinguished, the twin dangers are sophistication and ambiguity. Talk of phonemes and their allophones, morphemes and allomorphs is for the linguistic scholar, not the teacher or student. An initial teaching orthography should be the simplest in form and substance that will achieve its purpose: Phonemic rather than phonetic; making all those distinctions and only those distinctions which are semantically significant; and making only those distinctions readily recognizable by the average untrained ear. Incidentally, it should be broad enough to absorb the most important regional differences--a problem which will be discussed later.

Specifically, consider the 40 sounds distinguished by Pitmanic Shorthand, commonly classed as 24 consonants, 12 vowels and 4 diphthongs, disregarding such sophistications as whether the vowel sounds of bait or boat are, in fact, diphthongs, or whether the "vowel" sounds of youth and few are different or the same, and if the same, whether they are both consonant plus vowel or both true diphthongs. These 40 sounds are the only phonemic basis for writing English which has been proved in practical experience by millions of writers for more than a century. If you will subtract from the 44 characters of i.t.a., 4 characters: c (an alternate for /k/); the reversed z (an alternate for /z/); the wh ligature (a single character for the consonant cluster /hw/); and the modified r (which merely signals that the preceding vowel is to be pronounced as schwa), you will have

remaining this basic 40-sound structure. To these 40 phonemes must be added some provision for schwa, which in shorthand writing is usually disregarded or omitted, but which must be recognized and provided for by some means in long-hand or print. This phonemic basis is the soundest (no pun intended) foundation for an initial teaching orthography. Possible modifications to meet particular purposes will be discussed later.

To maintain uniformity of symbolization in the face of regional differences in pronunciation, this basic code should maintain distinctions which a large number of cultivated speakers do make, even tho another large number of cultivated speakers do not make them; e. g.

Writing post-vocalic /r/, which "r-keepers" pronounce, but which "r-droppers" omit (as in far), or reduce to schwa (as in near).

Writing wh (for /hw/), altho a substantial number of speakers, especially southern British, do not distinguish it from /w/.

Distinguishing the vowel of father and calm from the vowel of bother and comma, as in most British pronunciation, altho general American pronunciation does not make this distinction. This has the added advantage that (except before r) it follows quite closely the T. O. spellings with a and o respectively.

Uniformity in symbolizing lesser divergencies will be greatly facilitated by the tendency of each region to attach its own values to the

symbols, especially for the vowel sounds. For a textbook or dictionary key to pronunciation, to be read rather than written, three ambivalent symbols will further facilitate this; more particularly:

> For the vowel of ask, bath, aunt, which varies regionally but also unpredictably between the vowels of cam and calm, with the former more usual in the United States
>
> For the vowel of air, care, their, which varies regionally between the vowels of bat, bet, or bait; use of the latter, as in Pitman shorthand, causing the least confusion
>
> For the high unstressed vowel, sometimes called schwi, which combines all of the shortness of i in bit with much of the closeness of ee in beet; heard in the last vowel of any, the first vowel of believe.

Symbols

The symbols for an initial teaching orthography may be derived from either of two sources:

> Standardizing the Roman alphabet, by assigning to each single letter and to each digraph selected to represent those sounds for which the available single letters do not suffice, a single sound, keeping strictly within the resources of the universally available Roman alphabet; as exemplified by WES.

Supplementing the Roman alphabet, by assigning to each of the 23 useful letters (exclusive of c, q and x) a single invariable value, and creating some 17 or more new symbols; as exemplified by i.t.a.

A third theoretically possible source is supplanting the Roman alphabet, by creating and making available on typewriters and composing machines thruout the world some 41 wholly new characters, quite independent of the Roman alphabet; as specified by Shaw for his Proposed British Alphabet.(10) This is an interesting philosophic speculation, but completely unrealistic in that it eliminates the indispensable factor of "self-reading" compatibility(See below).

Assignment of Symbols to Sounds

An initial teaching orthography should have, so far as practicable, only one symbol for each sound, and should regard, so far as possible, the predominant T.O. spellings of sounds. This aspect is important primarily for writing. Conversely, it should have, so far as practicable, only one sound for each symbol, and should regard, so far as possible, the predominant T.O. pronunciations of the symbols. This aspect is important primarily for reading.

Note that these two limitations are not just inverted statements of the same fact. Thus the predominant spellings of the name sounds of A, E, U are the letters a, e, u, but the predominant pronunciations of the letters a, e, u are as

in bat, bet, but respectively. Similarly, the commonest spelling of the phoneme /z/ is the letter s, but the commonest pronunciation of the letter s is /s/. It is the ignoring of this second aspect which completely invalidates the data of Lee's 1957 study "Is The Irregularity With Which English Is Spelled An Important Cause Of Reading Difficulty?" (6)

In applying these criteria, a successful initial teaching orthography must achieve a substantially "self-reading" degree of compatibility with T. O.; that is, a degree of similarity to the words and graphemes of T. O. such that the notation may be immediately readable by those familiar only with T. O., and that T. O. may be readable with little further study by those who have mastered the phonemic notation. It should achieve this goal, of course, with as few rules or exceptions, alternative spellings or ambiguous pronunciations, as possible. Unfortunately, however, once the basic 40-sounds, 40-symbols code has been determined, all further gains in compatibility must come from concessions from strictly phonemic symbolization, with a corresponding departure from complete simplicity. This equation between simplicity and compatibility is the final, most searching test of the validity of a phonemic initial teaching orthography.

It is in striking this balance between simplicity and compatibility that the chief differences between a spelling reform notation and an initial teaching orthography appear. A spelling reform notation, to be written as well as read by the general public, must emphasize maximum simplicity; that is, a minimum of rules

or exceptions or alternatives, even at some expense of compatibility. On the other hand, while almost any reasonably phonemic notation, regardless of idiosyncrasies of symbolization, may be learned far more easily than T.O., an initial teaching orthography stands or falls on the ease of transition to reading and writing T.O. Considerably greater emphasis on compatibility, thru alternative symbolizations, rules or exceptions (provided that these affect a significant proportion of words) is therefore warranted, for these alternatives are, in effect, a preparatory phase of the transition, and mistakes due to wrong choice of alternatives during the temporary period of writing the initial teaching orthography, are of no lasting importance.

To guide these crucial decisions, both in setting up and in applying the code, objective data on the relative frequency, both of phonemes and graphemes, are greatly needed. So far as writing, more particularly learning to spell, is concerned, data on a dictionary basis (unweighted for the relative frequency of occurrence of particular words) may be sufficient, but for reading, which is the primary function of an initial teaching orthography, data which take into account frequency of occurrence on the printed page are considerably more significant. So far as phonemes and phoneme combinations are concerned, my Relativ Frequency of English Speech Sounds (3) still provides the most significant data available -- data which have been relied on in the most important revision of the British New Spelling in 1930, in the construction of Ogden's Basic English, and of Pitman's i.t.a., as well as a host of less well-known projects. For graphemes,

the available data are much less adequate. By far the most significant data thus far available are in a recent study by Hanna (3), which examined about 17,000 words, based on the Thorndike-Lorge list (6), which was culled from about 15,000,000 running words. This study reported on phoneme-grapheme correspondences, taking into account such further factors as position in the syllable and the presence or absence of stress. His data, however, give no indication of the relative frequency of occurrence of particular graphemes on the printed page. for his category of most frequent words (corresponding to the Thorndike-Lorge A.m) includes, without discrimination, words ranging in frequency from the, probably about 75,000 occurrences per million running words, down to words such as winter, for example, with a probable frequency of about 100 occurrences in a million. I have in process a study of the occurrence of graphemes, based on the 100,000 running words of my study of phonemes, which should give, for the first time, trustworthy data on the relative frequency of occurrence of the commonest spellings of the sounds of English.(4) In passing, it is interesting to note that Hanna finds, in his 17,000 word corpus, a total of 334 spellings of 52 phonemes, requiring 170-odd different graphemes, as compared with 507 spellings of 41 phonemes, requiring 262 different graphemes in the 1963 edition of my English Hsterografy.(1)

Using these data and taking into account further so-called environmental factors, and the morphological factors of compounding, affixation, and word families, the Hanna study then constructed an algorithm or rule of procedure.

which manipulated 77 different graphemes according to 203 rules. A computer programmed according to this algorithm was able to spell just under 50% of the investigated 17,000 words correctly, and another 36% with only one error! I can think of no more significant measure of the potential value of an initial teaching ortnography or the ultimate importance of eventual spelling reform than is provided by those figures.

Pitfalls

Before turning to an examination of i.t.a. as the outstanding example of an initial teaching ortnography of the <u>supplementing</u> type, and of World English Spelling (WES) as the most thoroly researched example of the <u>standardizing</u> type, a word as to the commonest faults found in phonemic notations, whether devised as initial teaching orthographies or, more frequently, for spelling reform without recognizing the important differences in emphasis involved in an initial teaching orthography.

Phonemic faults, common to both the supplementing and standardizing types, include distinguishing too few, or occasionally too many, different phonemes; assigning existing single letters with too little regard for their predominant values in T.O.; and introducing too many rules or exceptions for phonemes or word groups of relatively infrequent occurrence.

Perhaps the most egregious fault, in any type of notation, is misuse of the letters c, q and/or x for values wholly unrelated to their T. O. significations (e.g., for vowels or instead of consonant digraphs for wholly unrelated values, such as th), for this involves the effort of dissociation from any previous familiarity, which is a constant offense against compatibility, and, for an initial teaching orthography, an eventual redissociation from the acquired alternative value. Closely related to this fault, in its psychologic impact, is the use of caps and/or small caps for values other than the corresponding lower-case letters.

Another somewhat less serious, but nevertheless severe, graphemic handicap is the attempt to base an entire new (but professedly Romanic) alphabet on upper-case forms, which are inherently less legible for lack of ascenders and descenders, instead of on the lower-case forms which make up over 95% of our reading and at least 99% of all our writing.

Yet another unnecessary handicap is the effort to provide a duplicate alphabet of upper-case as well as lower-case forms, and sometimes even two more alphabets of large and small cursive letters, instead of concentrating on a single lower-case form, to be written disjoined (manuscript writing) for handwriting, with an enlarged or heavier letter or a single diacritic (capsign) to identify capitals where desired.

The temptation to use diacritics is another pitfall which combines the disadvantages of both the supplementing and standardizing solutions, for a letter with

a diacritic mark is, for the printer, just as much an additional character as a new design, and on the typewriter requires three strokes (letter - backspace - diacritic), unless the typewriter has been altered to provide a dead key, in which case it still requires two strokes.

For the standardizing, no-new-letter type of notation, to which the immediate future of spelling reform chiefly belongs, because of the enormous difficulties of making new characters available in hundreds of type faces and sizes in tens of thousands of printing plants and on tens of millions of typewriters, the central problem is choice and assignment of digraphs. Here the commonest fault is failure to recognize that a digraph is a unit quite independent of the values of the component letters, and should therefore be devised and assigned for maximum compatibility with T. O. usages, rather than striving for a forced or logical relationship to the component letters at the cost of a bizarre result.

i.t.a.

Turning now to i. t. a. as the outstanding example of an initial teaching orthography which supplements the resources of the Roman alphabet by additional characters, we find, quite predictably, that by our criteria its phonemic basis (that is, the number and nature of the sounds to be distinguished) rates practically 100%. The 40-sound foundation is supplemented by schwa, using both of the suggested devices: retaining any single letter of T. O.; and a special symbol, the

modified r, which is, in effect, a diacritic signaling that the immediately preceding vowel, stressed or unstressed, is to be pronounced as schwa.

Graphically, the code is greatly simplified, and its effectiveness correspondingly increased, by having only one form, corresponding to lower-case print, for each symbol; identifying capitals merely by a slight increase in size.

Assignment of the single letters of the basic code agrees completely (except for the inclusion of c as well as k) with the long experience of the British New Spelling, as well as the spelling reform version of WES. In my judgment, for the purposes under consideration, these assignments cannot be improved upon.

Of the 20 new symbols supplied by i.t.a., 13 are easily recognizable ligatures of the digraphs employed by New Spelling and WES, which again are in complete agreement on 11 of these (all except the two symbols for th). Since these digraphs in turn are based largely on prevailing T.O. practice, their form, altho more cumbersome in use than a simple unitary character, undoubtedly contributes somewhat to the ease of the all-important transition to T.O.

Most of the remaining 7 i.t.a. symbols (the majority being for phonemes of relatively low frequency) are obviously suggestive of familiar T.O. graphemes. The precise forms of some are perhaps debatable, but personally I regard criticisms of these details as altogether unprofitable at this time, for assuming that some could be improved, the overall effect on teaching results would be too slight to be significantly measurable by any tests now available, and the encouragement

which such tinkering would give to what Sir James has called Babelization would be unfortunate for all concerned. Personally, I doubt if a significantly better initial teaching orthography of the supplementing type can be devised. The one aspect that does abundantly warrant experimental determination is the choice between the supplementing type and the standardizing, no-new-letter type, of which more hereafter.

While certain aspects of the basic i.t.a. code itself, e.g., choice of relatively cumbersome symbol forms resembling familiar T.O. graphemes, instead of streamlined forms designed to save effort and space and therewith money (the aspect on which Shaw laid chief emphasis), tend to differentiate it from a spelling reform notation, the chief differences appear in the application of the code; the deliberate departures from strictly phonemic writing, thru rules and exceptions based on T.O. practice rather than on phonemic distinctions, which collectively enhance compatibility in ways which contribute directly to the all-important transition to reading and writing in T.O. This aspect has been too little understood or justly evaluated by some of the more vocal critics of i.t.a.

It is at this point that objective data are particularly valuable; nevertheless, subjective judgment finally enters in, in determining how small a gain in compatibility warrants an additional rule or exception. Thus, one of the most dependable phonic generalizations of T.O. is that where a single vowel is followed by a doubled consonant, the preceding vowel is short. In consequence, the i.t.a.

rule retaining doubled consonants for a single sound where T. O. has doubled consonants, improves the compatibility of nearly 7,000 words in 100,000 running words, and preserves the exact T. O. forms of about 2,000. Similarly, some 80% of T. O. spellings of the /k/ phoneme involve the letter c to some extent; so that the i. t. a. practice of writing c (including cc and ck) where T. O. employs c for the /k/ sound, improves the compatibility of some 6,500 words out of 100,000, and retains the precise T. O. forms of some 1,200. On the other hand, the rule or exception which writes tch after a vowel, where T. O. has tch, but ch where it does not (writing clutch but much, etch but each, match but ranch, etc.), which affects less than 1 word in 1,000 running words, is difficult to ustify. In between, lie such borderline cases as writing nature or picture as naetuer or pictuer, instead of naechur or picchur, altho current dictionaries no longer allow the more careful pronunciation, which affect only about 2 words in 1,000, but offer a distinct advantage in preserving the root which is retained in such derivatives as native or pictorial. On balance, it is most unlikely that experimental tinkering with such minutiae would yield significant differences in overall results, as measured by any tests presently available.

To summarize, it would seem that, for the present, far more may be accomplished for education by research to explore and develop the full possibilities of a phonemic notation as an initial teaching medium, using the wealth of teaching materials, more than a thousand items, already available in this particular medium, i. t. a., rather than by seeking for minor adjustments before the major factors have been fully explored.

WES

We come, finally, to an examination of the one outstanding example of an initial teaching orthography of the standardizing, no-new-letter type, summarized in the folder "World English Spelling (WES) for better reading" (8), which has been made available at this meeting. The spelling reform version of WES has been developed over a period of nearly a century by some of the foremost linguistic scholars of Great Britain and the United States. As an initial teaching orthography, this has been modified in the light of the distinctive concessions from strictly phonemic writing, for the sake of compatibility, recently developed and tested by i.t.a. Since both WES and i.t.a. derive most of their phonemic structure and much of their symbolization from the same sources, it is not surprising that they are virtually identical, except for the elimination of new characters by use of digraphs instead of ligatures or new letter forms.

More particularly, the phonemic basis of 40 phonemes is identical, but WES treats schwa by simple rules only, without a special diacritic symbol. The assignments of the 24 single letters employed (excluding q and x in both notations) are identical and 12 of the 13 ligatured symbols of i.t.a. transliterate directly into the corresponding digraphs of WES. Of the 7 remaining i.t.a. symbols, WES eliminates the alternate forms for z and r, and for the rest substitutes the digraphs zh, ng, aa, oo, uu, of which only zh and uu are wholly strange.

In applying the basic code, the spelling rules and exceptions of WES for the sake of greater compatibility with T. O. are virtually identical with i.t.a., except for eliminating marginal details of insignificant effect, such as the tch alternative previously referred to, or the writing of judge as judzh instead of uj. This has been done, not only because those carefully studied exceptions to phonemic writing are one of the important factors in the success of i.t.a., but also to eliminate, so far as possible in experimental comparisons, any independent variable, other than the fundamental difference between the supplementing and standardizing types.

The case for employing new characters not in the universally available Roman alphabet, rests on the logical premise that a simple phonemic notation should have an explicit unitary character (a standardized digraph is an explicit symbol) for each phoneme; and on the assumption that a beginning student, especially an infant, will be confused by the fact that the value of a digraph is rarely if ever a fusion of the values of the separate letters; e.g., the sound of th in then is not that of t plus h in shorthand; ng in spring is not the n plus g in engage; the sound of au in author is not a fusion of the vowel sounds of bat and but; ie in tie is not a fusion of the vowel sounds of bit and bet, etc., etc. To this assumption there are at least three replies.

1) The number of digraphs, exclusive of doubled consonants, in the leading languages of Western Europe, ranges from 5 or 6 for Spanish or Italian, to 22 for Dutch, with a medium of 12 or 14 for French or German; yet so far as I am aware, no spelling reform movement in any of these countries has included proposals to create new single characters to replace these digraphs.

2) Misleading juxtapositions, such as in shorthand or engage, are so infrequent as to be almost negligible, and in any case may be separated by a dot in the earliest stages of learning, if this be deemed necessary.

3) So far as either the theoretic or practical ob ections are concerned, a ligature below a digraph, used if desired at its first introduction or during the first weeks of learning, makes it just as much a unitary symbol as the ligature above or between the component parts of the majority of the i.t.a. ligatured symbols.

If it can be demonstrated that the educational results obtainable with the standardizing type, no-new-letter orthography (WES), keeping strictly within the limitations of the universally available Roman alphabet, are at least comparable with those obtainable with the supplementing type (i.t.a.), the former offers certain important advantages, both in the classroom and after.

In the classroom, for the pupil, it obviates learning to read, and especially to write, 20 new characters which will shortly be abandoned. For the teacher, it facilitates preparation, on any standard typewriter, of supplementary teaching materials adapted to meet particular situations. For both pupil and teacher, it permits use of the standard typewriter as a teaching instrument in the earliest grades, the great possibilities of which were demonstrated by Wood and Freeman 35 years ago.

For the adult abroad who has been taught English as a second language, WES offers the exciting possibility of continuing to use it as an international auxiliary medium of communication; reading traditional orthography but writing in WES, thereby bypassing the considerable added burden of learning to write, i.e., to spell, T.O. Incidentally, for the native adult, who gets fed up with some of the grosser idiosyncrasies of T.O., it interposes no obstacle to carrying over into his own personal writing such phonemic forms as the spirit moves him to retain.

It is such possibilities as the above, both in and out of the classroom, which give point and even urgency to controlled experimentation with a no-new-letter initial teaching orthography, more particularly WES. Abundant teaching materials of high quality, from many publishers, are already available for i.t.a. I feel confident that sufficient materials of comparable quality can be provided for WES, probably with the help of some foundation, as soon as qualified investigators are ready to undertake the task.

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